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NOTICE OF ALLOWANCE AND FEE(S) DUE

26710 7590 05/18/2009

QUARLES & BRADY LLP
411 E. WISCONSIN AVENUE
SUITE 2040
MILWAUKEE, WI 53202-4497

EXAMINER	
WANG, JACK K	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 05/18/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,755	09/11/2006	Aristedis A. Ikiades	132167.00005	3034

TITLE OF INVENTION: ICE DETECTION APPARATUS AND METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	08/18/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,755	09/11/2006	Aristedis A. Ikiades	132167.00005	3034

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nonprovisional	NO	$1510	$300	$0	$1810	08/18/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
WANG, JACK K	2612	340-580000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 37 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 37 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/560,755	IKIADES ET AL.	
	Examiner	Art Unit	
	JACK WANG	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *3/10/2009*.

2. ☒ The allowed claim(s) is/are *1-24*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Daniel J. Ark on April 27, 2009.

The application has been amended as follows:

In the claims:

1. (currently amended) An [[A]]apparatus for detecting ice accretion comprising:
an electromagnetic radiation emitter and a corresponding array of sensors that is closer to the emitter than any other emitter, the emitter being located intermediate of the corresponding array of sensors and at least some of the sensors being located at different distances from the emitter; and a comparator configured to compare a detected intensity of the diffused radiation to a predetermined value and to determine whether the detected intensity is above the predetermined value such that a data processing equipment determines the type of accreted ice.
2. (currently amended) The [[A]]apparatus as claimed in claim 1 in which the sensors are substantially symmetrical about the emitter.
3. (currently amended) The [[A]]apparatus as claimed in claim 1 in which the array of sensors comprises a first set of sensors and a second set of sensors, the first and second sets of sensors being arranged to follow respective paths generally away from the emitter.

4. (currently amended) The [[A]]apparatus as claimed in claim 3 in which the sets of sensors are arranged in respective radial paths.

5. (currently amended) The [[A]]apparatus as claimed in claim 3 in which the array of sensors further comprises third and fourth sets of sensors, the first, second, third and fourth sets of sensors together forming a substantially cruciform arrangement of sensors about the emitter.

6. (currently amended) The [[A]]apparatus as claimed in claim 1 in which the array of sensors is substantially flush with a surface in which the array is mounted.

7. (currently amended) The [[A]]apparatus as claimed in claim 1 which is an apparatus for detecting ice accretion on an aircraft surface.

9. (currently amended) The[[A]] method as claimed in claim 8 which comprises comparing the detected intensity of the diffused radiation at different distances from the emitter to respective predetermined values so as to determine the type of accreted ice.

10. (currently amended) The[[A]] method as claimed in claim 9 which comprises determining whether the detected intensity of diffused radiation at a particular distance from the emitter is above a predetermined threshold value.

11. (currently amended) The[[A]] method as claimed in claim 9 which comprises determining the type of accreted ice in response to which sensors at different distances from the emitter detect scattered and/or reflected intensity of diffused radiation above respective predetermined threshold values.

12. (currently amended) The[[A]] method as claimed in claim 8 which comprises selecting a look-up table of detected intensity values of diffused radiation and ice thickness values in response to the determined ice type.

13. (currently amended) The[[A]] method as claimed in claim 12 which comprises determining ice thickness by locating a value of ice thickness in the respective look-up table which corresponds to a detected intensity of diffused radiation at a particular distance from the emitter.

14. (currently amended) The[[A]] method as claimed in claim 13 which comprises using the value of detected intensity of diffused radiation which corresponds to a sensor position which is closest to the emitter to determine the ice thickness from the look-up table.

15. (currently amended) A [[D]]data processing equipment for ice detection apparatus comprising comparator means, the comparator means, in use, receiving signals representative of the intensity of diffused radiation which comprises radiation scattered and/or reflected by a layer of accreted ice, which diffused radiation is detected by an array of sensors, at least some of the sensors being located at different distances from a corresponding electromagnetic radiation emitter that is closer to the array of sensors than any other emitter, the comparator means being configured to compare detected intensity of the diffused radiation to a predetermined value and determine whether said value of detected intensity of the diffused radiation is above the predetermined value so as to enable the data processing equipment to determine the type of accreted ice.

16. (currently amended) The [[D]]data processing equipment as claimed in claim 15 in which the comparator means is configured to compare the detected intensity of the diffused radiation to predetermined values and determine whether said values of detected intensity of the diffused radiation are above the predetermined values so as to enable the data processing equipment to determine the type of accreted ice.

17. (currently amended) The [[D]]data processing equipment as claimed in claim 16 in which the comparator means is configured to compare detected intensity of diffused radiation at different distances from the emitter to respective predetermined values.

18. (currently amended) The [[D]]data processing equipment as claimed in claim 17 in which the comparator means comprises multiple comparators, each comparator being input with a signal which is representative of a detected intensity of diffused radiation at a respective distance from the emitter.

19. (currently amended) The [[D]]data processing equipment as claimed in claim 18 in which each comparator is configured to compare a received detected intensity of diffused radiation to a respective threshold value.

20. (currently amended) The [[D]]data processing equipment as claimed in claim 19 in which outputs of the comparators are indicative of the type of the accreted ice.

21. (currently amended) The [[D]]data processing equipment as claimed in claim 20 in which the outputs of the comparators are input into a logic array, the logic array being configured to output a binary number which is indicative of the type of the accreted ice.

22. (currently amended) The [[D]]data processing equipment as claimed in claim 15 which comprises a memory which stores look-up tables of detected intensity values of diffused radiation and corresponding ice thickness values for different ice types.

23. (currently amended) The [[D]]data processing equipment as claimed in claim 22 which is configured to select [[a]]the look-up table in response to the determined ice type.

24. (currently amended) The [[D]]data processing equipment as claimed in claim 22[[23]] which is configured to determine ice thickness by locating an ice thickness value in the look-up

table which corresponds to a detected intensity of diffused radiation.

Allowable Subject Matter

2. Claims 1-24 are allowed.

3. The following is an examiner's statement of reasons for allowance: the invention feature an apparatus and method for detecting ice accretion comprising: an electromagnetic radiation emitter and a corresponding array of sensors that is closer to the emitter than any other emitter, the emitter being located intermediate of the corresponding array of sensors and at least some of the sensors being located at different distances from the emitter; and a comparator configured to compare a detected intensity of the diffused radiation to a predetermined value and to determine whether the detected intensity is above the predetermined value such that a data processing equipment determines the type of accreted ice. The closest prior art, Padawer et al. (US Patent # 5,484,121) teaches a system for detecting ice on the external surface of aircraft with multiple sensor mounted flush with aircraft wing emitted coded radiation reflected back to a corresponding sensor, and Kim (US Patent # 5,784, 091) teaches a fiber optic ice detector for detecting thickness of a semi transparent ice layer. The references, either singularly or in combination, fail to anticipate or render the above limitation obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACK WANG whose telephone number is (571)272-1938. The examiner can normally be reached on M-F 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Wu can be reached on 571-272-2964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JKW/

/Daniel Wu/
Supervisory Patent Examiner, Art Unit 2612